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Innovation Transfer through Cross-national Migrant Workers

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Introduction

Up till now most of the discussions about migrant workers are concerning with the world labor market. In this paper, cross-national migrant workers are considered as the mediators of innovation transfer rather than labor force itself. It is hypothesized that innovation transfer can be achieved through the migrant workers. Innovation is used to mean everything that is new to a person when he or she comes across different cultures in foreign countries(1). Innovation transfer does not only include technology transfer, in the broad sense, the transfer of everything advanced and acceptable is included as well. In this paper the following questions will be discussed based on the survey conducted in Brazil, China and the Philippines in 1997-1999: 1) What innovation is to the migrant workers? 2) How the innovation is transferred through the migrant workers? 3) What are the main factors which influence the achievement of innovation transferability?

Ⅰ. Field survey

The survey is funded by Nihon Mombusho from 1997 to 1999, and the main purpose of which is to find out the likelihood of innovation transfer through the migrant workers. Brazil, China and the Philippines are selected as the field countries. Three types of questionnaires for the migrant workers were formulated. The first one is for the migrant trainee-workers in the transnational corporations (TNCs), the second one is for the migrant workers in the manufacturing sector (construction is included) with no relation with TNCs, and the third one is for the workers who worked in the non-manufacturing sector, such as entertainers, housekeepers and so on. For the first type, 300 respondents are selected mainly from Japanese transnational corporations, and some from European

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and American transnational corporations as well. We selected TNCs in the similar type of industries, mainly automobile and electronics. Sixty-eight answered questionnaires from Brazil, 67 from China, and 40 from the Philippines were sent back to us. For the second type, 400 respondents from Japan, Middle-east, Hong Kong, Korea and some other areas are selected. All the 176 respondents from China, and some of respondents from Brazil and the Philippines have returned their questionnaires. For the third type, 80 of the respondents are from the Philippines, who returned from Japan and Hong Kong. The questionnaires have not been sent back yet, but we expect them back at the end of this year. For this paper, the information collected from the questionnaires and interview survey will be analyzed.

The questionnaires are designed taking into consideration the similarities as well as peculiarities of the migrant workers from the three field countries. The questionnaires for the first type (TNCs) are almost the same for the three countries, as the process of labor sending and labor receiving are very similar. While as the questionnaires for the second type are made somewhat different for the three field countries, due to the peculiarities of the three field countries, as far as the process of labor sending and the labor receiving are concerned. The respondents in Brazil, China and the Philippines are mostly Japanese-Brazilians, trainees and migrant workers back from the Middle-east respectively.

Ⅱ. The achievements of working abroad

The achievements of working abroad are different between the manufacturing sector and non-manufacturing sector. Even in the manufacturing sector, it is different between the migrant workers working for the TNCs and non-TNCs. Firstly, it is necessary to know what the trainees in the TNCs expect to get and what they have achieved through the training abroad. In Table 1, the data show the trainees' expectation with regard to obtaining technological know-how, and the data in Table 2 show the extent by which technological know-how has been successfully transferred through training.

Table 1　Expectation of obtaining technology know-how　(%)

Country	Very much	Some what	Not so much	Total	Missing V
Brazil	56 (83.6)	7 (10.4)	3 (4.5)	67	1
China	55 (82.1)	12 (17.9)	0	68	1
Philippines	35 (87.5)	2 (5.0)	1 (2.5)	40	2

Table 2　Extent of technological know-how acquisition　(%)

Country	Very much	Some what	Not so much	Total	Missing V
Brazil	41 (61.2)	21 (31.3)	3 (4.5)	67	2
China	38 (57.6)	24 (36.4)	2 (3.0)	66	2
Philippines	35 (87.5)	5 (12.5)	0	40	0

From Table 1 and Table 2, it can be gathered that the expectations of acquiring technological know-how in the three field countries are all very high. However the extent to which technological know-how is actually acquired in Brazil and China is lower than that in the Philippines.

Table 3 The expectation of promotion in the company (%)

Country	Very much	Some what	Not so much	Total	Missing V
Brazil	19 (28.4)	23 (34.3)	24 (35.8)	67	2
China	6 (9.1)	24 (36.4)	34 (51.5)	66	2
Philippines	22 (55.0)	8 (20.0)	9 (22.5)	40	1

Figures in Table 3 and Table 4, imply that the trainees in the TNCs in the Philippines have much stronger expectation of getting promotion in the company. Upon return from training abroad, the promotion rate for trainees in the Philippines is higher than in Brazil and much higher than in China.

Table 4 Extent of getting a promotion in the company (%)

Country	Very much	Some what	Not so much	Total	Missing V
Brazil	13 (19.4)	23 (34.3)	27 (40.3)	67	4
China	4 (6.5)	17 (27.4)	41 (66.1)	68	6
Philippines	17 (45.0)	13 (32.5)	8 (20.0)	40	1

Table 5 The desire to see a developed country like Japan (%)

Country	Very much	Some what	Not so much	Total	Missing V
Brazil	37 (55.2)	21 (31.3)	7 (10.4)	67	2
China	26 (39.4)	35 (53.0)	3 (4.5)	66	2
Philippines	33 (82.5)	5 (12.5)	1 (2.5)	40	1

Table 5 shows the desire to see a developed country is the lowest in China (39.4%), then Brazil (55.2%), and the highest in the Philippines (82.5%).

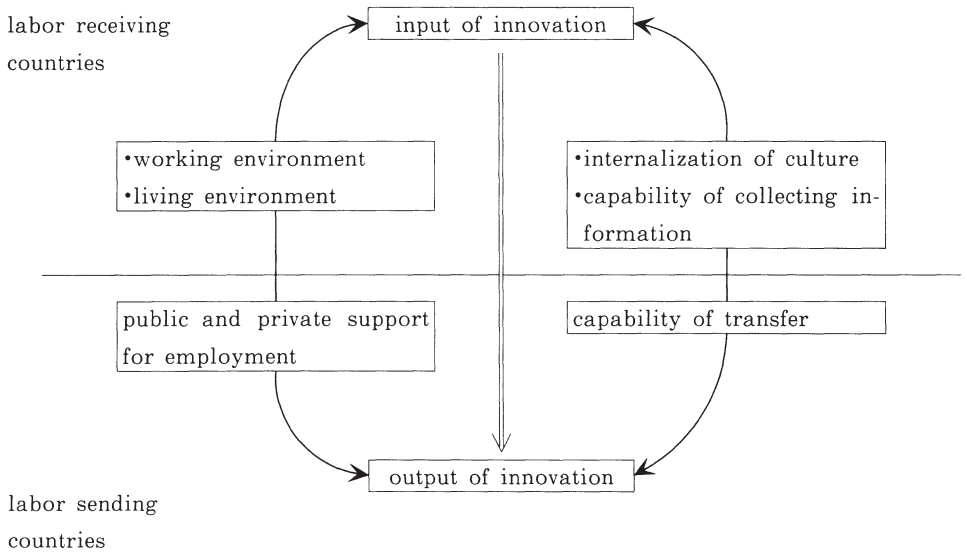
Ⅲ. Model of innovation transfer

Before innovation transfer is discussed, it is necessary to clarify what innovation exactly means. Innovation can be classified into two categories. One includes the advanced technology, skill and know-how used in the manufacturing process, and the other goes beyond technology, such as human resource organization and management, culture, values, different social systems, and ets. Innovation transferability, on the other hand, means the degree of realization of innovation transfer. Generally speaking, the former is

achieved through intensive training, which can be valued accurately within a certain period. The later, however, is achieved through observation and experience, and is difficult to assess within a certain period. In other words, it also can be said that the transferability of the former is definitely visible in a short term, while that of the later is much ambiguous and is liable to be ignored.

In the process of the innovation transfer, it can be hypothesized that there are two sub-processes of input and output. The input process which takes place in labor receiving areas, means the absorption of innovation. While the output process which takes place in labor sending areas, means the utilization of the innovation the trainees have learned during their stay in labor receiving areas.

Model for Innovation Transfer



Next we will discuss the main factors which affect the two sub-processes. The input process involves personal quality, working environment, and living environment. As for personal quality, two variables are taken into account. One is the internalization of an individual's original culture and the other is the capability of collecting information. The internalization of the original culture can be analyzed by how an individual is socialized by his original culture and how an individual sticks to his original culture such as value judgment, life style and so on. The individual's capability to collect information meanwhile is influenced by personal character, educational background, religious background and even sociability.

To analyze the influence of a person's internalization of his original culture to the input process in the innovation transfer, the above mentioned data have shown a clear

tendency. It is found that the expectation towards training in the three field countries is highest in the Philippines, then in Brazil, and lowest in China, regardless of the technology, promotion, or experience of a different culture. I will explain this phenomenon using the degree of internalization of the original culture. It is pointed out that there is a tendency that the stronger the internalization an individual has achieved, the more proud he is of his culture, and the weaker the desire to accept a different culture[(2)]. From the survey, it can be said that cultural internalization is related to the original culture's position in its cultural sphere. If the positions of the three field countries in their own cultural sphere are taken into account, results show that China is just at the center, Brazil is near the center, and Philippines is at the circumference of their own cultural sphere. Therefore it can be summarized that the cultural internalization is much more achievable in the countries where the original culture is at the center than in the circumference of a cultural sphere.

The results further reveal that with the same cultural background, the cultural internalization is further correlated with a person's educational background. As expected, it is found that the cultural internalization is much more achievable for those who have graduated from a college or a university than those who have graduated from a high school or a middle school.

Table 6 Resistance towards Japanese culture (Chinese) (%)

Education	Difficulty to adjust to food	Difficulty to adjust to work practice	Total
Univ, college	12 (52.2)	8 (34.8)	23
High school	29 (29.6)	29 (29.6)	98
Middle school	10 (22.2)	9 (20.0)	45

The data in Table 6 indicate that the higher the educational level of a person, the more difficulty it is for him or her to adjust to a different life style and working style abroad.

Working and living environment serve as the interface for the trainees to access to new technology, production system, different culture and different social system. The working environment, on the other hand, provides the migrant workers the opportunities to access to the new technology, skill and know how, and the communication activities with local society are mainly viewed as indicators for the living environment.

In the output process, the employment opportunities are the main variables by which the migrant workers can utilize the innovation they have learned from abroad. In order to enhance the employment capability, it is indispensable both for the government and the individual to make a concerted effort. The effort at the individual level mainly means the positive attitude of returnees to invest their money into productive activities and make good use of the skill and experiences gotten abroad. While the effort at the government level mainly includes intervention and support policies to increase employment opportunities for the returnees and stimulate productive investment.

Ⅳ. What inputs the migrant workers possess for innovation transfer.

1. The innovation input in the manufacturing sector

Firstly we will check the migrant workers who worked in the manufacturing sector and see what they have inputted during the production process. Table 7 presents the data from the pre-survey of 28 trainees back from Japan, who worked in the manufacturing sector. "The deep impression" and "the experience expected to be transferred" are used to measure the contents that have been inputted.

Table 7　The deep impression about Japan. and the experience they want to take back to their country. (manufacturing sector)

Content	Deep impression	Experience expected to be transferred
Product quality control	60.7%	64.3%
Production process	53.6%	67.9%
Advanced equipment	53.6%	39.3%
Workers' working attitude	46.4%	35.7%
Workers' multi-operating system	21.4%	3.6%
QC activity	28.6%	14.3%
Workers skill leverl	7.0%	7.1%

From Table 7, it can be viewed that only 7% of the migrant workers selected "workers' skill lever" which is very low, and the items related with management system garnered high percentage. Also "workers' working attitude" accounts for 46.4%, and 35.7% of the workers expected to transfer it to their own country.

2. The innovation inputted in the non-manufacturing sector

Most of the migrant workers in the non-manufacturing sector worked as housekeepers, car drivers and entertainers. Table 8 presents what they have absorbed in the input process. As for the migrant workers who worked in the non-manufacturing sector, what have been inputted are greatly influenced by the personal relationship between migrant workers and their employers, because most of their work are support services to persons.

Table 8　What have been learnt & what is expected to be utilized (non-manufacture sector)

Content	What have been learnt	Experience expected to be utilized
Foreign language	64.6%	40.2%
Shop management	32.3%	25.8%
Different culture	77.3%	38.7%

Table 8 shows that a high percentage (77.3%) of the migrants answered that they have learnt about a "different culture" and 38.7% answered that they "expect the different culture to be utilized" in their own country. From this it can be said that the culture in the labor receiving countries makes a good impression on the migrant workers. In the long run, it leaves a great possibility for the culture in the labor receiving countries to be transferred to the labor sending countries. From the interview survey, it is also found that the personal relationship between migrant workers and their employer has a correlation with the input process. The more the workers are satisfied with their employers, the more they have learnt, and the more active they want to accept the new experience and new ideas.

V. How the migrant workers get information input.

According to the type of industries, the process of input varies. In the manufacturing sector, the means to input information concerning the production process are greatly influenced by the decision and the arrangement of the host companies. The information input about daily life, meanwhile, is much more influenced by personal characteristic, such as educational background, character, religious background and even sociability.

In the manufacturing sector, most of the host companies have clear expectation towards migrant workers. Table 9 lists the training methods the host companies used to help the foreign workers absorb the know-how about the production process.

Table 9 Training methods for the foreign workers (multi answers) (%)

Method	Very useful	Somewhat useful	Useless	Total
Seminars	78 (48.1)	67 (41.4)	17 (10.5)	162
Field visit	102 (65.0)	46 (29.3)	9 (5.7)	157
OJT	122 (73.9)	36 (21.8)	7 (4.2)	165
Personal instructor	46 (28.2)	106 (65.0)	12 (7.4)	163
Facilities used for training	32 (19.0)	112 (66.6)	24 (14.3)	168

As for the efficiency of the above methods, OJT (On-Job-Training) is the most efficient and useful, then field visit and seminars. In the interview survey, some of them said that they have mastered most of the operation method and quality control through OJT. The respondents told us that the personal instructors took the responsibility to help them to adjust to the working and living environment much more than giving them instruction about skill training. Many of the host companies provide accommodation to the foreign workers, and most of them live together, so they seldom have a chance to communicate with the local people. About 60% of the migrant workers answered that they got information concerning their daily lives and work from the local coworkers, especially from the personal instructors, and about 30% of the respondents replied that their personal instructors took them to leisure activities during holidays. About 17% of

the respondents indicated that their personal instructors are their most intimate friends in Japan. It can then be said that personal instructors play an important role in helping migrant workers to get acquainted with the Japanese culture and Japanese society in addition to the technical instruction.

Generally speaking, the work of the migrant workers in the non-manufacturing sectors is rather simple although sometimes tedious. In most cases the training is done in a very limited time. The work in this sector are mostly support services to people, such as housekeepers, drivers and entertainers, so there is almost no clear time allocation for the training methods which are introduced in non-manufacturing sector. The input process are fulfilled during the process of their work and daily lives. What they have inputted are new ideas rather than technique. Therefore the personal factors influence the input process more than the training methods. The differences in sensibility toward a new environment result in different input contents, sensibility being greatly influenced by that person's socialization process.

In the input process for innovation transfer, it is also important to analyze how the migrant workers get access to the local information. In the survey, results reveal that information access is correlated with educational background.

Table 10　The mediators access to local information % (use sometime)

Education	Mass media	Public guidance	Volunteer	Fellow workers
University	50.0	50.0	13.3	16.7
College	47.1	52.9	35.3	35.3
High school	42.2	40.8	13.3	13.3
Middle school	34.7	22.2	2.2	2.2

(migrant workers in the manufacturing sector in non-TNCs)

Table 11　Public facilities used % (use sometime)

Education	Library	Pool	Gym	Public service
University	33.3	16.7	0	0
College	64.7	0	17.6	23.5
High school	31.6	31.6	6.1	15.3
Middle school	13.3	22.2	2.2	13.3

(migrant workers in manufacturing sector in non-TNCs)

Table 12　Channel to access information %

Education	Local group	Language class	Company activities	Family party
University	0	33.3	16.7	16.7
College	17.6	58.8	47.0	41.2
High school	25.5	13.3	31.6	21.4
Middle school	11.1	8.8	35.6	15.6

(migrant workers in manufacturing sector in non-TNC)

From Tables 11, 12 and 13, it is viewed that the higher educational level of a person, the more active he is in accessing to information abroad. Therefore it can be deduced that high educational background can help a migrant worker to adjust to the life and working environment abroad much more smoothly and quickly.

VI. How the migrant workers manifest innovation output

Next we will discuss the output process in the three field countries, where a common phenomenon can be observed. That is most of the migrant workers in the manufacturing sector wanted to be employed, so they could utilize their skill and knowledge, while the migrant workers in the non-manufacturing sectors have much stronger desire to open their own businesses.

During the interview survey we asked them about how much they are satisfied with the output process, and if they are not satisfied, what are the reasons. Generally the trainees in the TNCs are more satisfied with the output process, as the production system and management of the TNCs and the factories abroad are very similar. However, migrant workers who went abroad but work for non-TNCs are not satisfied with the output process. The main reasons stated are:

(1) The equipment level are totally different, so their experiences can not be utilized.
(2) Production system is different hence, it is very difficult to change.
(3) The key executives have their own ideas about management and production, so it is difficult to persuade them to accept the new idea.
(4) Lack of local government consultancy services.

The trainees in the TNCs, generally speaking, have no employment problems. Most of them are sent to the training programs jointly sponsored by the home office and the branch in the three field countries, and they usually go back to their former companies. But the employment situation is very serious for the migrant workers in non-TNCs after they return home.

The main factors which influence the output process in the TNCs are value differences toward technology and the different attitude toward team work. In the questionnaires, the question, "if you thought the technology and management know-how learnt abroad is difficult or cannot be used in your company, to what extent have the following been affected." is included. "Difficulty to receive cooperation from fellow workers", is the most popular answer with the highest percentage of 32.3% in China,next comes Brazil with 24.4% and the Philippines with 20.0%. This shows that cultural values toward team work are different among the three field countries. Most of the trainees take the skill they have achieved through the training abroad as their personal asset with which they can win the competition. Though there are some QC activities, yet very few of them will teach others what they have learnt through the training. Therefore, it is very important to create a system in the TNCs to get the returnees' innovation outputted directly.

As for the migrant workers in the manufacturing sector (construction is included) in

the non-TNCs, the employment opportunity is very important for the sub-process of output. The employment situation is different for the three field countries. When there was a big rush of Brazilian-Japanese into Japan, the globalization of Brazil progressed rapidly. With the increase of the foreign investment into Brazil, large shopping centers and cooperatives emerged suddenly. The number of small shops, as well as the small-scale enterprises however become declined. The competition in Brazil became severe, so it is difficult for small investments to survive. In response to this situation, a project of cooperation in Curitiba was launched. Under this project,the money of returnees are collected to form a rather large-scale business such as food processing. All the investors will get a return on their investment. In this business the returnees are given priority in employment. At present the business is doing good. and the investor can get 20% dividend which is higher than the interest rate for banks deposit. Some returnees have successfully set up their own businesses in the service sector such as cleaning houses and automobile repair factories. One of them told us that he worked in an automobile repair factory near Tokyo for 7 years, and now he has put-up his own automobile repair factory in Curitiba. What makes his factory different from the other Brazilian factories is that he applies 'Just in time', including starting work on time and delivering the automobile on time. This has won him popularity with the local society. On the contrary, some returnees can not find satisfiable jobs after going back to Brazil, so many of them have to return to Japan many times.

Of the three field countries, China has the highest the percentage of returnees who go back to the former companies. Most of these companies are state-run companies, where the management are quite different from the host companies abroad. However the returnees have an opportunity to utilize their skill and experience in case they are promoted to a certain position, such as a branch manager. There are still some returnees (3.6%) who have set up their own private businesses, most of which are small-scale businesses in the service sector, such as restaurants and shop. I visited some restaurants run by returnees and all of them serve "Oshibori", which is very well received by the customers.

In the Philippines, successful stories of the returnees from abroad are not so many. We are told that many of the high class managers and technicians go to Saudi Arabia and work there for many years. With the alteration of the migrant law in Saudi Arabia, the regulations get more strict with the migrant workers, so many high level professionals are expected to come back to the Philippines. Recently some people are prepared to start a project that would give stimulation for investment and thus provide some opportunities to demonstrate their innovation output.

As for the migrant worker in the non-manufacturing sector such as entertainers and housekeepers, many returnees keep their personal network with their friends abroad and get their cooperation in the output process, such as starting a business. At this point, the local government's intervention is necessary to increase the employment opportunities, otherwise the returnees will have no chance to show their innovation outputs. In the Philippines many migrant workers in the non-manufacturing sector have come back from

abroad. The Philippines government has set up a governmental agency, OWWA (Overseas Workers Welfare Administration), to formulate some supporting polices, such as low-interest loan and information support. In the Philippines, deposit interest rate is rather high so some of the returnees deposit their money in the banks instead of investing it in business. In order to utilize the returnees' skill and experiences, OWWA offers business loans with 13% interest rate, which is lower than the bank loan interest rate (over 20%), in order to stimulate the returnees to open small private businesses. In the survey, it is found that although the scale of businesses the returnees have opened with the loan are small, they are greatly satisfied with their businesses as well as with their peaceful family life. This contrasts with the so called repeaters who go abroad again and again and have to be separated from their families. Taking Ms. A as an example, she went to Japan twice as an entertainer. After she returned to her home town, she got to know about the OWWA loan, and she submitted an application to set-up a pig breeding farm. Her pig farm was successful and with the profit from the farm she opened a small shop. Another case is Ms.O. She opened a restaurant using the OWWA loan. and now her business is doing good. In order to support their businesses, OWWA also sends them some information concerning their businesses and provide consultants if necessary. These successful stories give some confidence to the returnees, most of whom are housewives now. Some other returnees told us that they also want to apply for the OWWA loan to open a small business. These success stories show that the returnees succeed in business mainly due to the new ideas and persistence. In other words, value alteration rather than achievement of technology or skill is behind their successes.

Conclusion

This research has proven that migrant workers have played important roles in the process of innovation transfer. To take cross-national labor migration only as a labor issue is a very narrow perception. It is important to look at cross-national workers as mediators between the developing countries and the developed countries, because the innovation transfer can be achieved through the migrant workers. During the process of innovation transfer, interventionist policies of the government, specially the local government, play a prime role in providing the environment and infrastructure. It can not be overlooked that in the process of input and output, the cultural background and personal factors have strong influences yet are difficult to be quantified.

Notes:

(1) 古田暁監修 石井敏・他 (1986)『異文化コミュニケーション』有斐閣, 236.

(2) Lixing Chen, (1998) Cross-culture Management in Joint Venture Companies-Case of Japan Investment in China, International Conference, The Euro-Asia Centre, February 1998.

付　記

本文は1997-1999年度文部省科学研究費による調査研究に基づくものである。本文はブラジル、フィリピン、中国に帰国した労働者に対するアンケート調査と聞き取り調査結果の分析から構成されている。課題番号09041083。研究課題：国際労働移動を通じた技術移転の可能性に関する研究。(On Technology Transferability through Migrant Workers)